AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A method of analysing a sequence of images of a deformable object in non-rigid motion, comprising:

detecting the boundary of the object in each image of the sequence and fitting a non-rigid contour to the detected boundary;

tracking the boundary through the sequence by calculating a shape-space representation with respect to a first shape-space ~~shape space~~ of the movement of the non-rigid contour through the sequence;

defining a second, different shape-space whose shape vector comprises components corresponding to a desired attribute of the motion; and

calculating from the tracked boundary the shape-vector corresponding to the different shape-space.

Claim 2 (Previously Presented): A method according to claim 49, further comprising displaying graphically the calculated amount of movement of each of the segments of the detected boundary.

Claim 3 (Previously Presented): A method according to claim 49, further comprising calculating and outputting for each of the segments of the detected boundary an average of the amount of movement of that segment.

Claim 4 (Previously Presented): A method according to claim 49, further comprising calculating for each of the segments of the detected boundary the variation in the amount of movement within that segment.

Claim 5 (Previously Presented): A method according to claim 49, further comprising calculating for each of the segments the maximal excursion of the detected boundary during the non-rigid motion.

Claim 6 (Previously Presented): A method according to claim 49, wherein the object is an internal body organ of a human or animal and the segments are clinically-significant segments of the organ.

Claim 7 (Previously Presented): A method according to claim 6, wherein the images are produced by a technique selected from the group consisting of: ultrasound-based, MR-based and x-ray based, imaging and nuclear medicine.

Claim 8 (Previously Presented): A method according to claim 1, wherein the non-rigid contour is a spline curve.

Claim 9 (Previously Presented): A method according to claim 8, further comprising visually locating the boundary in only some selected images in the sequence and fitting the spline curve to the visually located boundary in each selected image by calculation of the control points for the spline curve.

Claim 10 (Previously Presented): A method according to claim 9, wherein the first shape-space representation represents of the movement of the spline curve control points through the selected images.

Claim 11 (Previously Presented): A method according to claim 1, wherein the shape-space is calculated by performing a principal component analysis (PCA) of the movement of the boundary through the selected images.

Claim 12 (Previously Presented): A method according to claim 9, further comprising predicting the position of the boundary in each frame of the sequence based on the spline curve, detecting image features representative of the boundary in the vicinity of the predicted position of the boundary, and correcting the predicted position on the basis of the detected image features.

Claim 13 (Previously Presented): A method according to claim 8, further comprising displaying the spline curve overlying the image.

Claim 14 (Previously Presented): A method according to claim 8, further comprising calculating and outputting for each of the segments an average of the amount of movement of control points of the spline curve for that segment.

Claim 15 (Previously Presented): A method according to claim 14, wherein the average is weighted in favour of spline curve control points in the middle of each segment.

Claim 16 (Previously Presented): A method according to claim 8, further comprising calculating and outputting for each of the segments a measure of the variation in the amount of movement of control points of the spline curve for that segment.

Claim 17 (Previously Presented): A method according to claim 8, further comprising calculating and outputting for each of the segments a measure of the maximal excursion of control points of the spline curve for that segment.

Claim 18 (Previously Presented): A method according to claim 8, further comprising calculating from control points of the spline curve the shape-vector corresponding to the different shape-space.

Claim 19 (Previously Presented): A method according to claim 18, wherein a pseudo-inverse of the different shape-space space is defined to produce as components of the shape-vector a measure of the movement of the spline curve control points for each of the segments.

Claim 20 (Previously Presented): A method according to claim 19, further comprising displaying graphically the variation through the sequence of the shape-vector components.

Claim 21 (Previously Presented): A method according to claim 8, wherein four spline function control points are defined for each of the segments.

Claim 22 (Previously Presented): A method according to claim 1 wherein the boundary is an inner boundary of a wall of the object, and the method further comprises:

searching outside the inner boundary for image features representing an outer boundary of the wall of the object.

Claim 23 (Previously Presented): A method according to claim 22, further comprising fitting a spline curve to the detected image features representing the outer boundary.

Claim 24 (Previously Presented): A method according to claim 23, wherein the spline curve is fitted by:

manually locating the inner and outer boundaries in only some images of the sequence;

calculating a shape-space for the change through the sequence of the distance between the two boundaries;

detecting the inner boundary and performing the search outside the inner boundary for image features representing the outer boundary in images of the sequence; and

fitting a spline curve to the detected image features in the other images of the sequence by using the shape-space.

Claim 25 (Previously Presented): A method according to claim 24, further comprising performing a principal component analysis of the change in the distance between the two boundaries, as a basis for the shape-space.

Claim 26 (Previously Presented): A method according to claim 22, wherein the searching outside the inner boundary for image features representing the outer boundary comprises detecting and analysing changes in the image intensity outwards from the inner boundary.

Claim 27 (Previously Presented): A method according to claim 26, further comprising detecting a ridge in a plot of the image intensity outwards from the inner boundary.

Claim 28 (Previously Presented): A method according to claim 27, further comprising performing a wavelet decomposition of the plot of the image intensity to smooth the plot and detecting as the ridge a maximum in the smoothed plot.

Claim 29 (Previously Presented): A method according to claim 26, wherein the search is conducted along a plurality of search lines spaced along and extending radially outwardly from the inner boundary.

Claim 30 (Previously Presented): A method according to claim 23, wherein, when fitting the spline curve to the detected image features, the detected image features are weighted down if they imply a high curvature of the outer boundary.

Claim 31 (Previously Presented): A method according to claim 24, wherein, when fitting the spline curve to the detected image features, the detected image features are weighted down if they imply a difference between the inner and outer boundaries which lies outside the shape-space space for that difference.

Claim 32 (Previously Presented): A method according to claim 22, wherein the images are ultrasound images.

Claim 33 (Previously Presented): A method according to claim 22, wherein the object is a human or animal organ.

Claim 34 (Previously Presented): A method according to claim 22, wherein the object is a human or animal heart.

Claim 35 (Previously Presented): A method according to claim 34, wherein the object is the left or right ventricle.

Claim 36 (Previously Presented): A method according to claim 34, further comprising graphically displaying the change through the sequence of the distance between the inner and outer boundaries as a representation of myocardial thickening.

Claim 37 (Previously Presented): A method according to claim 34, further comprising segmenting the wall of the heart and graphically displaying for each segment the change through the sequence of the distance between the inner and outer boundaries as a representation of myocardial thickening for that segment.

Claim 38 (Previously Presented): A method according to claim 37, wherein the distance between the inner and outer boundaries is averaged or integrated for within each segment.

Claim 39 (Previously Presented): A method according to claim 37, further comprising calculating the variation within each segment of the change through the sequence of the distance between the inner and outer boundaries.

Claims 40-47 (Cancelled).

Claim 48 (Previously Presented): A computer program storage medium readable by a computer system and tangibly embodying a computer program comprising computer-executable instructions for performing the method of claim 1.

Claim 49 (Previously Presented): A method according to claim 1, wherein the components of the shape-vector correspond to the movement of different segments of the detected boundary.

Claim 50 (Previously Presented): A method of analysing a sequence of images of an internal body organ in non-rigid motion, comprising:

detecting the boundary of the organ in each image of the sequence; and

automatically calculating the amount of movement through the sequence of each of a plurality of clinically significant segments of the detected boundary,

wherein a spline curve is fitted to the boundary and the method further comprises calculating and outputting for each of the clinically significant segments an average of the amount of movement of the spline curve control points for that segment, the average being weighted in favour of spline curve control points in the middle of each segment.

Claim 51 (Previously Presented): A method of analysing a sequence of images of a deformable object in non-rigid motion to detect inner and outer boundaries of a wall of the object, the method comprising:

detecting the inner boundary; and

searching outside the inner boundary for image features representing the outer boundary,

wherein the method further comprises fitting a spline curve to the detected image features representing the outer boundary,

wherein the spline curve is fitted by:

manually locating the inner and outer boundaries in only some images of the sequence;

calculating a shape-space for the change through the sequence of the distance between the two boundaries;

detecting the inner boundary and performing the search outside the inner boundary for image features representing the outer boundary in images of the sequence; and

fitting a spline curve to the detected image features in the other images of the sequence by using the shape-space; and

wherein, when fitting the spline curve to the detected image features, the detected image features are weighted down if they imply a difference between the inner and outer boundaries which lies outside the shape-space for that difference.

Claim 52 (Currently Amended): A method of analysing a sequence of images of a deformable object in non-rigid motion, the method comprising:

modeling the boundary using a non-rigid contour;

calculating a representation of movement of the contour through the sequence of images using a tracking shape-space ~~space shape~~; and

decomposing the calculated movement representation using an interpretational shape-space space shape that is different than the tracking shape-space ~~space shape~~.

Claim 53 (Previously Presented): A method according to claim 52, wherein the non-rigid contour is a spline curve.

Claim 54 (Previously Presented): A method according to claim 52, further comprising:

displaying the decomposed movement representation.

Claim 55 (Previously Presented): A method according to claim 52, further comprising:

generating numerical values corresponding to the decomposed movement representation.

Claim 56 (Previously Presented): A computer-readable medium on which computer-executable instructions for implementing the method of claim 52 are tangibly embodied.